Host-plant Disjunction in a New Species of *Neohoodiella* (Insecta, Thysanoptera, Phlaeothripinae),with Notes on Leaf-Frequenting Thrips in New South Wales Subtropical Rainforests

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Neohoodiella jennibeardae sp.n. is described breeding on the leaves of two unrelated plants in the rainforests of eastern Australia, the dicotyledonous tree *Ficus coronata* (Moraceae) and the monocotyledonous vine *Ripogonum elseyanum* (Smilacaceae). To confirm this remarkably disparate pair of host associations many other plants in these rainforests were examined. This new species was not found on any other plant, although about 40 thrips species were taken from the leaves of 40 plant species in 22 families, and these records are tabulated. *Neohoodiella* is known previously only from a single species in New Caledonia. The genus is characterised by the two character states: abdominal tube one third of body length; dorsal setae elongate but broadly capitate. The head of *N. jennibeardae* bears a bifurcate tubercle that is unique amongst Phlaeothripidae.

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KEYWORDS: Leeuweniini, *Neohoodiella jennibeardae*, host plant associations, subtropical rainforest.

INTRODUCTION

Despite the acknowledged diversity of the insect fauna in Australia's eastern rainforests (Monteith and Davies 1991), our knowledge of many groups is remarkably poor. For the order Thysanoptera, over most of the past 100 years, taxonomic descriptive work far outstripped any real understanding of the fauna. Most of these descriptions were by A. A. Girault, who published more than 130 species group names for thrips between 1924 and 1934 (Mound 1996), based mainly on single, often damaged, specimens, with no information about biology. Recent studies have been directed toward recognising the species described by Girault, establishing their structural variation and hence synonymies, and discovering their host plants (Mound 2002a). This report is part of broader project to understand the biology of a larger proportion of the Australian thrips fauna. Plant names are used as in Mabberley (1997).

Thrips species are proving to exhibit a wide diversity of interesting biological relationships. The apparent lack of natural enemies in *Thrips imaginis* Bagnall, the plague thrips that occurs in such vast numbers during early summer in southern Australia, has long been commented on (Andrewartha and Birch 1954). However, other endemic thrips species also produce huge and apparently unconstrained populations. One was reported recently as invading a school in vast numbers in Queensland (Mound et al. 2002). Moreover, this species has switched from breeding on its native host, *Araucaria*, to breeding on introduced northern hemisphere species of *Pinus*. Very large populations are reported also for thrips species that pollinate certain *Macrozamia* cycads in Australia, with up to 20 000 individuals occurring on a single male cone (Mound and Terry 2001; Terry 2001).

Many thrips species feed on fungi on dead branches or in leaf litter (Mound 2002b), whereas others are phytophagous either in flowers or on leaves, some on single plant species but with a few polyphagous (Mound 2002a). Thrips are increasingly being recognised as plant pollinators, some as generalists (Williams et al. 2001) but others highly specific (Mound and Terry 2001). Similarly, behaviour patterns shown by particular thrips species are increasingly being investigated, such as lekking by males as is now known in two species of Australian Thripidae (Gillespie et al. 2002). Domicile creation, with adults securing leaves together with silk or glue,

is described for several species of Phlaeothripidae (Mound and Morris 2001). This behaviour is often accompanied by deliberate female (but not male) de-alation, although the significance of such wing removal remains unexplored. Structural polymorphisms, within or between sexes, can be so great that isolated individuals of the same species would not be considered congeneric (Mound et al. 1998), but behaviour patterns associated with such intra-specific variation have been studied in few species.

Most recent research effort on thrips has been directed toward the arid zone of Australia (Crespi and Mound 1997). In this paper, a particularly bizarre new species is described from the eastern rainforests and observations recorded of its biology, this being the second member of a genus known previously only from New Caledonia. This new species was found breeding on the leaves of two very distantly related plants. To examine this disjunct host relationship, a survey was made of thrips associated with the leaves of many different plants in eastern rainforests around Taree, these records being tabulated and discussed below.

Neohoodiella Bournier

Neohoodiella Bournier 1997: 143. Type-species *N. grandisetis* Bournier.

The only previous species in this genus was described from a total of eight females and two males collected by a canopy fogging technique from unidentified forest trees in the Rivière Bleu region of New Caledonia. The genus is a member of the tribe Leeuweniini, in which the adults are distinguished from other leaf-feeding Phlaeothripinae by their elongate tenth abdominal segment, the tube (Ananthakrishnan 1970). In most Phlaeothripidae, the tube is little more than twice as long as the ninth abdominal segment, whereas in Leeuweniini the tube is usually more than four times as long as the preceding segment. *Neohoodiella* differs from the other genera currently recognised in this group in having extraordinarily long setae on the head and pronotum, and the tube 10 times as long as the ninth tergite.

Key to species of *Neohoodiella*

1. Body and legs mainly light brown; antennal segment III with 1 sense cone, IV with 2 sense cones; major setae of head and body with margins smooth; ocellar region not produced over bases of antennae; median pair of major setae on vertex arising anterior to postocular setae; pronotal anteromarginal setae minute; pronotal notopleura each with 2 major setae; pronotal posteroangular setae minute; mesonotal lateral setae minute; abdominal tergite IX setae B2 setaceous in contrast to capitate setae B1; New Caledonia .....*grandisetis* Bournier

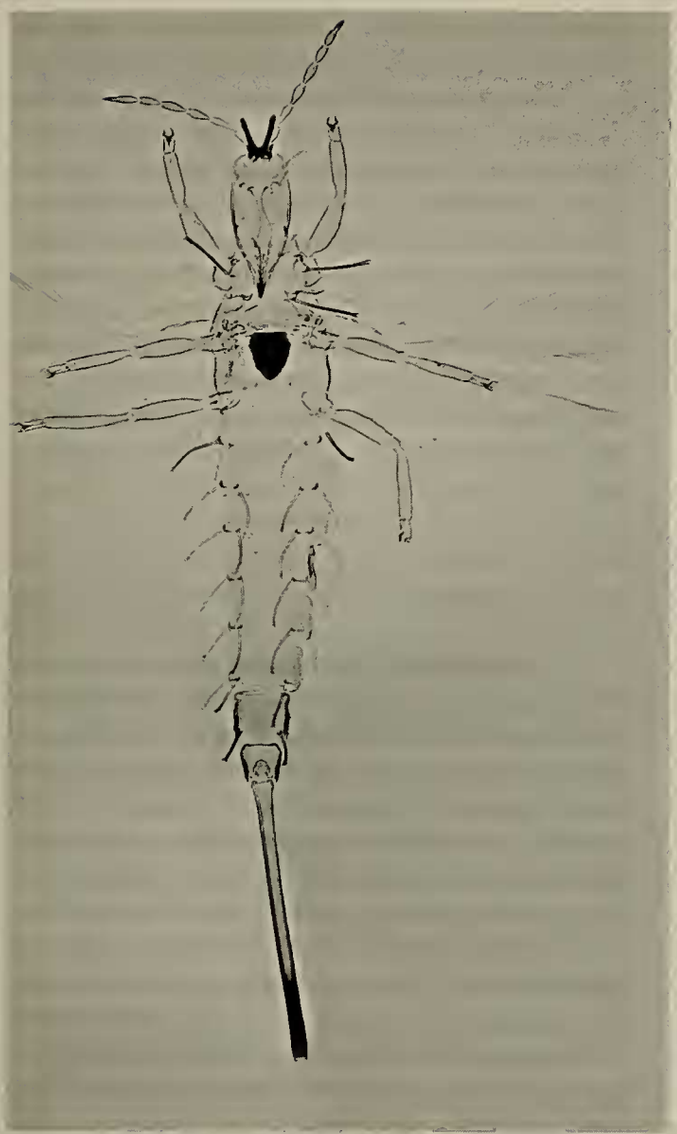
-. Body and legs mainly clear yellow, dark brown on metascutum, tube apex and frontal margin of head (Fig. 1); antennal segment III with 2 sense cones, IV with 3 sense cones (Fig. 4); major setae of head and body with margins coarsely spiculate (Fig. 3); ocellar region with black, V-shaped tubercle projecting over front ocellus and extending beyond apex of antennal II (Fig. 2); median pair of major setae on vertex arising posterior to postocular setae; pronotal anteromarginal setae elongate; pronotal notopleura each with one large and one minute seta; pronotal posteroangular setae elongate; mesonotal lateral setae capitate with shaft spiculate; abdominal tergite IX setae B1 and B2 similar in structure but B2 shorter; eastern Australia .....*jennibeardae* sp.n.

Neohoodiella jennibeardae sp.n.

Holotype ♀, **New South Wales**, Lorien Wildlife Refuge, 3km N of Lansdowne near Taree, from *Ficus coronata* leaf, 27.xii.2000 (LAM 3991), in ANIC, CSIRO Canberra.

Paratypes: 10♀ 6♂ taken with larvae; 1♀ 5♂ at same site, 11.i.2001 (G. Williams); 19km NW of Bellbrook, Nulla Nulla Creek, 1♀ 1♂ from *F. coronata* leaf, 11.i.2001 (G. Williams); NW of Wingham, Dingo State Forest, 4♀ 2♂ from *F. coronata* leaf, 16.xii.2001 (G. Williams); **Queensland**, 100km NW of Brisbane, Conondale N.P., from *Ripogonum elseyanum* leaves, 1♀, 10.x.2000, 3♀ 3♂ taken with larvae 18.iii.2001 (Dr Jenny Beard). Paratypes will be deposited in the US National Museum, Washington, Natural History Museum, London, and the Senckenberg Museum, Frankfurt.

Female macroptera. *Colour*: Body pale yellow; metanotum with dark brown area; head with ocellar area dark brown and bearing black forked tubercle; tube golden with distal quarter brown; forewings pale with short darker line in basal third; antennal segment I dark brown, II yellow, III – IV light brown, V – VIII yellow with apex light brown; major setae mainly yellow but tergites III – VII each with 2 setae pale brown, pronotum with midlateral and posteroangular setae dark brown, mesonotal lateral pair light brown, tergites II and VIII each with 2 setae dark brown. *Structure*: Body elongate (Fig. 1), all major setae unusually long with shafts spiculate and apices with crown-like fringe of stout spicules. Head longer than wide, cheeks convex; eyes slightly smaller dorsally than ventrally; ocellar region produced into pair of long



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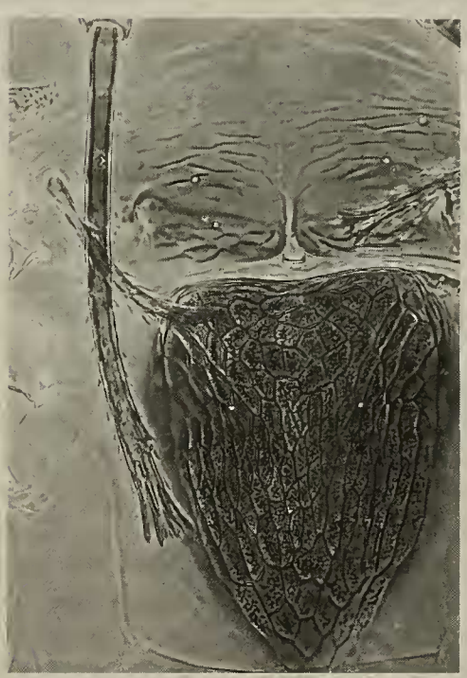

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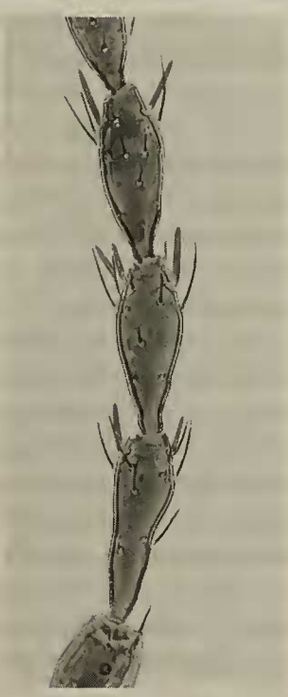

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Figures 1-4. ***Neohoodiella jennibeardae*****. 1, Male; 2, Cephalic tubercles; 3, Meso and metanota overlayed by the left pronotal posteroangular seta; 4, antennal segments II – VI.**

tubercles overlaying front ocellus and extending to apex of antennal segment II, these tubercles with margins spiculate and bearing about 12 small setae; two pairs of postocular setae extending beyond apex of antennal segment II; maxillary stylets retracted to postocular setae, close together medially; mouth cone extending across prosternum. Antennae 8-segmented; III with 2 sense cones, IV with 3 sense cones; VIII slender. Pronotum with 5 pairs of major setae, am shortest, pa and epim arising from pronounced tubercles that obscure the notopleural sutures; prosternal basantra not developed, ferna large, mesopraesternum reduced to paired lateral triangles; metathoracic sternopleural sutures not developed. Mesonotal lateral setae well developed; metanotum reticulate with markings internal to reticles, paired median setae minute (Fig. 3). Legs slender, fore tarsus with no tooth; all femora with one large capitate seta on external margin medially. Forewing slender without duplicated cilia; 3 sub-basal setae long and capitate. Pelta triangular, tergite I with one pair of major setae near spiracle; tergites II – VIII each with 2 pairs of major setae laterally arising from tubercles, II – VII each with 2 pairs of strongly sigmoid wing-retaining setae; tergite IX setae B1 and B2 capitate and spiculate, B3 setaceous; tube exceptionally elongate (Fig. 1).

Measurements (holotype ♀ in micrometres). Body length 3150. Head, length 250; width 200; midvertex setae 230; postocular setae 240; inner margin of ocellar tubercles 130. Pronotum, length 130; width 280; major setae – am 140, aa 200, ml 220, epim 240, pa 230. Forewing, length 1000; distal width 50; sub-basal setae 100, 110, 110. Tergite II lateral setae 190, 210. Tergite VIII lateral setae 180, 170. Tergite IX, length 100; setae B1 180, B2 90, B3 80. Tube, length 960; anal setae 450. Antennal segments I – VIII length, 40, 60, 90, 80, 70, 70, 60, 50.

Male macroptera. Indistinguishable from female in colour and structure but considerably smaller; sternite VIII with broad transverse glandular area on posterior half.

Larvae and pupae. Colour yellow, apex of tube and antennae light brown. All major setae unusually long with broadly capitate apices but shafts not spiculate; head with 2 pairs of setae on vertex; pronotum with 6 pairs; meso and metanota each with 5 pairs; tergites I – VIII each with 2 pairs arising from tubercles; tube three times as long as head.

SYSTEMATIC RELATIONSHIPS

Members of the Leeuweniini are recorded from various countries between India, New Caledonia and Australia (Ananthakrishnan 1970), but only two other species have been described with long setae on the head and pronotum. These are the Indian species, *Kochumania excelsa* Ananthakrishnan (1969), which has the tube little more than twice as long the ninth tergite, and *Neohoodiella grandisetis* in which the tube is 10 times as long as the ninth tergite. Systematic relationships between the genera in the Leeuweniini require further study. The new species is remarkable for the pale yellow colour of the adults as well as the larvae, because adults of almost all large thrips species are brown to black. This pale colour, in combination with the long dorsal setae, results in the individuals being well camouflaged on the leaf surface.

OBSERVATIONS ON BIOLOGY

In common with other members of the Phlaeothripidae, the life history of *N. jennibeardae* involves two larval instars and three pupal instars. All of these life stages, from egg to adult, have been found on the leaves of *Ficus coronata* (Moraceae), a sandpaper fig, at a number of rainforest sites in the region of Taree (NSW), and it has been taken from this plant at sites between northwest of Kempsey and southeast of Gloucester. Moreover, larvae and pupae have been found on the leaves of *Ripogonum elseyanum* (Ripogoneaceae) at Conondale National Park just north of Brisbane (Qld). Although unrelated, the leaves of these two plant species are similar in texture, with prominent hairy veins on the lower surfaces.

Despite the wide separation between the two collection areas, the distribution of *N. jennibeardae* appears patchy and unpredictable. The population on one particular tree at Lorien Wildlife Refuge, Lansdowne, was observed regularly over a period of 18 months. In December, 2000, the thrips could be found on many leaves of this tree, all life stages being present. However, this population progressively declined, until by April 2002 only a single adult could be found. If this fluctuation in population size is normal, then our failure to find the thrips on the majority of *F. coronata* trees that have been examined gives no information about its real distribution. The leaves of this tree species are particularly long-lived, and populations of this thrips presumably prosper only in years when fresh growth is abundant.

Eggs of this thrips are deposited on the lower surface of leaves, but in contrast to many other leaf-feeding Phlaeothripinae the eggs are scattered rather than in groups. This is possibly an adaptation to avoid predation by other insects, because this thrips apparently overwinters primarily as these isolated eggs,

not as adults. Adults and larvae commonly position themselves close to prominent veins of a *Ficus* leaf and, because of the large number of setae on their dorsal surfaces, they blend into the hairy under-surface of the leaf lamina. When illuminated artificially, thrips move to the shaded side of a leaf, although in lower light intensities they remain on the hairy lower surfaces, even when a leaf is deliberately inverted. Individuals have also been observed to be active on the leaves of *Ficus* trees during the night. Pupae were present on leaves, but were particularly difficult to find beneath the curve of hairy major leaf veins. No evidence could be found of larvae falling to the ground to pupate.

The behaviour of adults and larvae was observed on detached leaves of *F. coronata* in petri dishes. The thrips are noticeably sluggish in their behaviour, quite unlike common flower-living species of Phlaeothripidae. When disturbed with a brush, they often sat lower onto the leaf surface, usually close to a vein, without being stimulated to walk or run. At other times when molested they waved the tube from side to side, often quite briskly, and sometimes raised it over the head. No aggression was observed between adults and larvae, but adults clearly explore the possibilities of mating. When a male first encountered a prospective mate he sometimes arched the tube over the female, although during copulation the tube was lowered horizontally. Copulation in one pair was observed to take about 1.5 minutes, but the male continued to straddle the female for a further half minute after copulating. During copulation, the male constantly stroked the female with his antennae, and appeared to stroke her abdomen with his mid and hind legs.

Because the two recorded host plants of this thrips belong to such widely unrelated plant families, and considering the geographical range noted above between Taree and Conondale, we attempted to discover the insect on other host plants. To this end, we examined the leaves of numerous tree, shrub, vine and fern species in subtropical rainforests at various sites of the mid-north coastal region of New South Wales. Collecting methods were either by examining leaf surfaces with the aid of a head-mounted magnifier, specimens being removed with a small artist's brush, or by beating fresh foliage of individual plant species onto a sheet or net. This yielded a considerable number of foliage associated thrips species, as listed in Table 1 (located at the end of the paper, p. 25), but produced no evidence for a more extensive host range for *N. jennibeardae*. In particular, this thrips was not found on the other common, but relatively smooth-leaved, species of either *Ficus* or *Ripogonum*.

N. jennibeardae thus appears to be restricted to just two unrelated plants. The first of these, *Ficus coronata* (Moraceae), is a small tree that is distributed widely from the Northern Territory, through Queensland to Victoria (Harden 1990). The second is a vine, *Ripogonum elseyanum* (Ripogoniaceae), that occurs in northern NSW north from Dorrigo to Queensland (Harden 1993). The distribution of these two plants overlaps in the rainforest of northern New South Wales.

NOTES ON LEAF-ASSOCIATED THRIPS

During the survey for alternative host plants for *N. jennibeardae*, various thrips species were taken around Taree from numerous unrelated plant taxa. Thrips are generally perceived as flower-living, but a considerable number of species rarely, if ever, visit flowers. Some species feed only on fungi, whereas others feed only on leaves. Because some of these small insects disperse on the wind, determining their precise biology from casual observations is fraught with difficulties. Adult thrips can be found, sometimes in considerable numbers, on plants to which they have no biological association. Moreover, adults sometimes feed on a plant species on which they do not breed. Thus recognition of true host plant associations amongst Thysanoptera is particularly difficult. The plants listed in Table I cannot be interpreted as the hosts of the thrips found on their leaves without further field studies, but these records provide a starting point for future studies. Many plant species examined in the field did not support thrips but, as indicated above for *Neohoodiella jennibeardae*, this could equally well reflect seasonal or spatial patterns of presence and abundance rather than patterns of non-exploitation by thrips.

One of the most commonly encountered species in this survey was the greenhouse thrips, *Heliothrips haemorrhoidalis* (Bouché), a member of the Thripidae sub-family Panchaetothripinae in which all species breed only on leaves (Mound et al. 2001). This thrips breeds on the leaves of a wide range of plants, particularly introduced species. Damage to native plants by introduced insects is not well documented, but this thrips was observed causing damage to leaves of *Tetrastigma nitens* (Vitaceae) and *Palmeria scandens* (Monimiaceae) near Taree, and large populations have been observed damaging the leaves of *Doryanthes excelsa* (Doryanthaceae) near Sydney. Adults of a related endemic species, *Helionothrips spinosus* Wilson, were found on many plant species, but there is currently no evidence that it breeds

anywhere other than on the leaves of *Smilax australis* (Smilacaceae). A third species of Panchaetothripinae, *Anisopilothrips venustulus* (Priesner), is known only from isolated adult females with no reliable host data, taken in many tropical countries and in Australia at scattered localities between Taree and Cape Tribulation in north Queensland. Another introduced panchaetothripine, *Parthenothrips dracaenae* (Heeger), is well known as a pest under domestic situations, damaging the Parlour Palm (*Chamaedorea elegans* - Palmae), but is not commonly taken in the field. In contrast, *Bhattithrips* Mound is an endemic panchaetothripine genus, with three described species and at least two more undescribed, but with no precise information on the biology of any of them.

The sub-family Dendrothripinae (Mound 1999b) appears to be better represented in rainforest than in the more arid parts of Australia. In a small floodplain rainforest remnant at Anthoneys Brush near Taree (see Williams 1993), females of *Ensiferothrips primus* Bianchi were found commonly on five plant species in five families. Females were also taken at other sites on the leaves of two further plant species. However, females together with males and larvae have been taken so far only from the vine *Trophis scandens scandens* (Moraceae) Curiously, this plant is absent from Anthoneys Brush, so the thrips is either highly dispersive or polyphagous. The only other member of this thrips genus, *E. secundus* Mound, is known only from Lord Howe Island, and during a recent visit to that island the host plant of this thrips was found to be the endemic sub-species, *T. scandens megacarpa*, rather than the plants mentioned with the original description (Mound 1999a).

Pseudodendrothrips gillespiei Mound was also described from Lord Howe Island, and several teneral adults were taken recently on that island from the leaves of *T. scandens megacarpa*. The record of one female of this species given here, from subtropical rainforest at Lorien Wildlife Refuge near Taree, represents the first record from the Australian mainland. The species listed as *Pseudodendrothrips* sp.n. was found in large numbers breeding on the leaves of *Ficus fraseri*, and was also taken in considerable numbers on *Ficus coronata* and *F. rubiginosa*. The colour of the forewings, however, varies among the samples taken, from mainly dark to banded. One female of *Dendrothrips glynn* Mound was taken, but the true host of this species is not known as it was based only on three females collected near Cairns. Similarly, the host plant of the widespread *Dendrothrips diaspora* Mound remains unknown, although collecting records suggest that this thrips is possibly polyphagous. In contrast, the species listed as *Dendrothrips* sp.n. was found breeding on the young leaves of the tree *Scolopia braunii* (Flacourtiaceae) at two widely separated sites.

The third sub-family of the Thripidae, the Sericothripinae, includes species that breed in flowers as well as species that breed on leaves. The female listed in Table I as *Neohydatothrips poeta* (Girault) is the third known specimen of this species, and the host plant remains unknown. In contrast, *N. haydni* (Girault) appears to be common on the young leaves of some species of *Indigofera* (Fabaceae), and possibly also on some species of *Swainsonia* (Fabaceae). The largest of the four sub-families of Thripidae, the Thripinae, includes many flower-living species. Williams, et al. (2001) recorded numerous Thripinae from the flowers of rainforest trees and shrubs in this study area, but in the present study, no attempt was made to sample thrips from flowers. Despite this, small numbers of the abundant flower-living species, *Thrips setipennis* (Bagnall), were taken on the leaves of *Claoxylon australe* (Euphorbiaceae), *Acradenia euodiiformis* (Rutaceae) and *Gmelina leichhardtii* (Labiatae), and a few specimens of *Anaphothrips* and *Bregmatothrips* that are possibly associated with grasses were also taken. Of the three leaf-feeding Thripinae in Table I, *Chaetanaphothrips orchidii* (Moulton) is introduced from southeast Asia, and was abundant on the leaves of an orchard tree, *Annona cherimola* (Annonaceae). *Scirtothrips dobroskyi* Moulton was described from the Philippines but is common in northeast Australia, and was found in large numbers on the terminal red leaves of another orchard tree, *Mangifera indica* (Anacardiaceae). The Oriental genus *Rhamphothrips* has only recently been recorded from Australia (Mound 2002a), based on a single female taken on the Cobourg Peninsula (Northern Territory), but an undescribed species of this genus seems to be widespread and abundant on the youngest leaves of *Cissus antarctica* (Vitaceae) in eastern NSW.

Amongst the Phlaeothripidae that were found, some host associations in the list can be dismissed; for example *Nesothrips* and *Hoplandrothrips* species are known to feed on fungi not on green leaves. However, the presence of large numbers of adult *Herathrips nativus* (Girault) on the leaves of *Drypetes deplanchei* (Euphorbiaceae) in dry rainforest at Kiwarrack State Forest south of Taree, is more difficult to understand. The structure of the mouthparts of this species, previously known only from the type series of eight specimens, indicates that it feeds on fungal spores. Single specimens of this species were also collected on leaves of *Baloghia inophylla* (Euphorbiaceae) and *Planchonella australis* (Sapotaceae) at the same site. It seems likely that a large population had built up

locally on dead leaves or branches, possibly on the lichens that are abundant at this site, and the individuals on leaves were part of a dispersing population.

The single specimen of *Hoodiella convergens* (Hood) from *Archontophoenix cunninghamiana* (Arecaceae) was presumably a stray, but adults and many larvae of this thrips were found in distorted and partially rolled leaves of the vine, *Tetrastigma nitens* (Vitaceae). One species, *Euoplothrips bagnalli* Hood, was taken in rolled leaf galls on several plants, sometimes in large numbers, but is considered more likely to be a kleptoparasite than a gall-inducing species (Marullo 2001). The rolled-leaf galls on *Smilax* are probably due to *Tolmetothrips smilacis* (Priesner), a species that is widespread northward into the tropics. Foliage beating produced two species of *Teuchothrips*, a genus of leaf-feeding thrips that currently includes 20 named species in Australia and at least as many un-named. The one from *Tetrastigma* has the antennae largely yellow, unlike any other member of the genus, and the one from *Citriobatus pauciflorus* (Pittosporaceae) is unusually small with both winged and wingless adults. The undescribed species of *Haplothrips* from *Austrosteenisia* (Fabaceae) is particularly interesting, because it was taken in large numbers, although without larvae, from the terminal leaflets of this plant, whereas *Haplothrips* species are usually flower-living. Similar in general appearance to this species were two that are presumed to be predatory, *Haplothrips bituberculatus* (Girault) and *Xylaplothrips clavipes* (Karny). The first is usually found on dead twigs, but the second is associated with the galls of other thrips.

Finally, four Phlaeothripidae are listed that were taken in rolled-leaf galls, three apparently representing new genera. The leaf galls on *Drypetes deplanchei* were unusual, involving the margin of each leaf folding in for a distance of about 2 mm, enclosing a narrow tubular space but with the actual margin flattened and closely adpressed to the upper surface of the leaf. Two very different species of thrips were involved; a small but abundant, micropterous species, similar in appearance to certain gall-inducing *Oncothrips* species, presumably induces the galls, but with a second and much larger species that is probably a kleptoparasite. The leaf rolls on *Acronychia oblongifolia* (Rutaceae) were more open and irregular, as is common amongst many members of *Teuchothrips*. These galls also contained two species; a large but short-winged species of *Teuchothrips* presumably induced the galls; the second species is apparently congeneric with an undescribed genus and species that commonly co-exists within the rolled-leaf galls of *Gynaikothrips australis* Bagnall on Moreton Bay fig trees (*Ficus macrophylla*).

These records, from a relatively small area but involving several undescribed taxa, indicate that the diversity of Thysanoptera in Australia's eastern rainforests is considerably higher than published records suggest.

ACKNOWLEDGMENTS

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Table 1.
Thysanoptera from leaves of subtropical rainforest plants near Taree, NSW. ('V' vine, 'S' shrub, 'T' tree, 'SF' State Forest, 'NR' Nature Reserve, 'NP' National Park)

Plant species		Thysanoptera species	Location	Plant community
Anacardiaceae				
Mangifera indica	T	*Scirtothrips dobroskyi*	Lorien Wildlife Refuge, 3 km N Lansdowne	wet sclerophyll forest
Annonaceae				
Annona cherimola	T	*Chaetanaphothrips orchidii*	Lorien Wildlife Refuge, 3 km N Lansdowne	wet sclerophyll forest
Arecaceae				
Archontophoenix cunninghamiana	T	*Hoodiella convergens*	Lorien Wildlife Refuge, 3 km N Lansdowne	riparian rainforest
		Liothrips sp.	Lorien Wildlife Refuge, 3 km N Lansdowne	riparian rainforest
Euphorbiaceae				
Baloghia inophylla	T	*Herathrips nativus*	Kiwarrak SF, S of Taree	dry rainforest
Breynia oblongifolia	S	*Anaphothrips sp.*	Lorien Wildlife Refuge, 3 km N Lansdowne	wet sclerophyll forest
		?Bregmatothrips sp.	Lorien Wildlife Refuge, 3 km N Lansdowne	wet sclerophyll forest
		Dendrothrips diaspora	Lorien Wildlife Refuge, 3 km N Lansdowne	wet sclerophyll forest
Bridelia exaltata	T	*Ensiferothrips primus*	Anthoneys Brush, NE of Taree	floodplain rainforest
Claoxylon australe	T/S	*Bhattithrips* sp. n.	Saltwater Reserve, SE Taree	littoral rainforest
		Thrips setipennis	Saltwater Reserve, SE Taree	littoral rainforest
Drypetes deplanchei	T	*Herathrips nativus*	Kiwarrak SF, S of Taree	dry rainforest
		Phlaeothripinae gen.n.2 & 3	Black Head 20km S Taree	littoral rainforest
Eupomatiaceae				
Eupomatia laurina	S/T	*Heliothrips haemorrhoidalis*	Saltwater Reserve, SE Taree	littoral rainforest
		Neohydatothrips poeta	Saltwater Reserve, SE Taree	littoral rainforest
Fabaceae				
Austrosteenisia blackii	V	*Haplothrips* sp.n.	Kiwarrak SF, S of Taree	dry rainforest
Indigofera sp.	S	*Neohydatothrips haydni*	Kiwarrak SF, S of Taree	dry rainforest
		Dendrothrips glynn	Kiwarrak SF, S of Taree	dry rainforest
Flacourtiaceae				
Scolopia braunii	T	*Dendrothrips* sp. n.	Lorien Wildlife Refuge, 3 km N Lansdowne	wet sclerophyll forest
		Dendrothrips sp. n.	Black Head 20km S Taree	littoral rainforest
Malvaceae				
Hibiscus heterophyllus	S	*Ensiferothrips primus*	Kiwarrak SF, S of Taree	wet sclerophyll forest

Plant species		Thysanoptera species	Location	Plant community
Monimiaceae				
Daphnandra micrantha	T	*Anisopilothrips venustulus*	Lorien Wildlife Refuge, 3 km N Lansdowne	subtropical rainforest
Palmeria scandens	V	*Heliothrips haemorrhoidalis*	Tapin Tops NP, NW Wingham	mixed subtropical rainforest – wet sclerophyll forest
		Heliothrips haemorrhoidalis	Upsalls Ck, Kerewong SF, WNW of Kendall	riparian subtropical rainforest
Moraceae				
Ficus coronata	T	*Pseudodendrothrips* sp.n.	Lorien Wildlife Refuge, 3 km N Lansdowne	wet sclerophyll forest
Ficus fraseri	T	*Pseudodendrothrips* sp. n.	Red Head, SE of Taree	headland littoral rainforest
		Thrips setipennis	Harrington	littoral rainforest
Ficus rubiginosa	T	*Ensiferothrips primus*	Anthoneys Brush, NE of Taree	floodplain rainforest
		Ensiferothrips primus	Kiwarrak SF, S of Taree	dry rainforest
		Pseudodendrothrips sp.n.	Kiwarrak SF, S of Taree	wet sclerophyll forest
Trophis scandens	V	*Ensiferothrips primus*	Lorien Wildlife Refuge, 3 km N Lansdowne	subtropical rainforest
		Ensiferothrips primus	Lansdowne Brush, 0.5 km SE Lansdowne	floodplain rainforest
		Ensiferothrips primus	Red Head, SE of Taree	headland littoral rainforest
		Pseudodendrothrips gillespiei	Lorien Wildlife Refuge, 3 km N Lansdowne	subtropical rainforest
Streblus brunonianus	T	*Ensiferothrips primus*	Anthoneys Brush, NE of Taree; Wingham Brush NR	floodplain rainforest
		Heliothrips haemorrhoidalis	Kiwarrak SF, S of Taree	dry rainforest
		Ensiferothrips primus	Kiwarrak SF, S of Taree	dry rainforest
		Xylaplothrips clavipes	Kiwarrak SF, S of Taree	dry rainforest
Myrtaceae				
Backhousia sciadophora	T	*Heliothrips haemorrhoidalis*	Woko NP, ~24 km NNW of Gloucester	dry rainforest
Rhodomyrtus psidioides	T	*Heliothrips haemorrhoidalis*	Lorien Wildlife Refuge, 3 km N Lansdowne	mixed rainforest – wet sclerophyll forest
		Heliothrips haemorrhoidalis	Lansdowne Brush, 0.5 km SE Lansdowne	floodplain rainforest
		Nesothrips propinquus	Lansdowne Brush, 0.5 km SE Lansdowne	floodplain rainforest
Waterhousea floribunda	T	*Liothrips* sp.	Lorien Wildlife Refuge, 3 km N Lansdowne	riparian rainforest
Oleaceae				
Notelaea longifolia	S/T	*Ensiferothrips primus*	Anthoneys Brush, NE of Taree	floodplain rainforest

Plant species		Thysanoptera species	Location	Plant community
Pittosporaceae				
Citriobatus pauciflorus	T	*Heliothrips haemorrhoidalis*	Kiwarrak SF, S of Taree	dry rainforest
		Parthenothrips dracaenae	Kiwarrak SF, S of Taree	dry rainforest
		Ensiferothrips primus	Kiwarrak SF, S of Taree	dry rainforest
		Euoplothrips bagnalli	Kiwarrak SF, S of Taree	dry rainforest
		Haplothrips bituberculatus	Kiwarrak SF, S of Taree	dry rainforest
		Xylaplothrips clavipes	Kiwarrak SF, S of Taree	dry rainforest
		Teuchothrips sp.n.	Kiwarrak SF, S of Taree	dry rainforest
Ripogonaceae				
Ripogonum album	V	*Heliothrips haemorrhoidalis*	Wingham Brush NR	floodplain rainforest
		Helionothrips spinosus	Wingham Brush NR	floodplain rainforest
Ripogonum discolor	V	*Helionothrips spinosus*	Lorien Wildlife Refuge, 3 km N Lansdowne	subtropical rainforest
Ripogonum fawcettianum	V	*Helionothrips spinosus*	Camden Head	headland littoral rainforest
Rubiaceae				
Morinda jasminoides	V	*Neohydatothrips* ?sp. n.	Lorien Wildlife Refuge 3 km N Lansdowne	subtropical rainforest
Rutaceae				
Acradenia euodiiformis	T	*Thrips setipennis*	Lorien Wildlife Refuge, 3 km N Lansdowne	subtropical rainforest
Acronychia oblongifolia	S	*Phlaeothripinae* gen.n.1	Lorien Wildlife Refuge,	Wet sclerophyll forest
		Teuchothrips sp.n.	3 km N Lansdowne	
Sapindaceae				
Mischocarpus pyriformis	T	*Heliothrips haemorrhoidalis*	Lansdowne Brush, 0.5 km SE Lansdowne	floodplain rainforest
		Haplothrips sp.	Lansdowne Brush, 0.5 km SE Lansdowne	floodplain rainforest
Sapotaceae				
Planchonella australis	T	*Heliothrips haemorrhoidalis*	Lansdowne Brush, 0.5 km SE Lansdowne	floodplain rainforest
		Hoplandrothrips sp.	Lansdowne Brush, 0.5 km SE Lansdowne	floodplain rainforest
		Herathrips nativus	Kiwarrak SF, S of Taree	dry rainforest
Smilacaceae				
Smilax australis	V	*Helionothrips spinosus*	Kiwarrak SF, S of Taree	dry rainforest
		Helionothrips spinosus	Red Head, SE of Taree	headland littoral rainforest
		Tolmetothrips smilacis	Black Head 20km S Taree	littoral rainforest
		Euoplothrips bagnalli	Black Head 20km S Taree	littoral rainforest
Smilax glyciphylla	V	*Helionothrips spinosus*	Saltwater Reserve, SE Taree	littoral rainforest
Ulmaceae				
Aphananthe philippinensis	T	*Ensiferothrips primus*	Anthoneys Brush, NE Taree	floodplain rainforest
Celtis paniculata	T	*Anisopilothrips venustulus*	Camden Head	headland littoral rainforest
		Helionothrips spinosus	Camden Head	headland littoral rainforest

Plant species		Thysanoptera species	Location	Plant community
Verbenaceae				
Gmelina leichhardtii	T	*Thrips setipennis*	Saltwater Reserve, SE Taree	littoral rainforest
Vitaceae				
Cissus antarctica	V	*Rhamphothrips* sp.n.	Lorien Wildlife Refuge, 3 km N Lansdowne	wet sclerophyll forest
Tetrastigma nitens	V	*Heliothrips haemorrhoidalis*	Woko NP, ~24 km NNW of Gloucester	dry rainforest
		Heliothrips haemorrhoidalis	Kiwarrak SF, S of Taree	dry rainforest
		Hoodiella convergens	Kiwarrak SF, S of Taree	dry rainforest
		Euoplothrips bagnalli	Kiwarrak SF, S of Taree	dry rainforest
		Teuchothrips sp.n.	Kiwarrak SF, S of Taree	dry rainforest